A SYNOPTICAL ACCOUNT OF THE STERCULIACEAE IN BANGLADESH

M. OLIUR RAHMAN1, MD. ABUL HASSAN, MD. MANZURUL KADIR MIA2 AND AHMED MOZAHARUL HUQ3

Department of Botany, University of Dhaka, Dhaka 1000, Bangladesh

Keywords: Taxonomy; Sterculiaceae; Nomenclature; Distribution; Bangladesh.

Abstract

Taxonomy, updated nomenclature and occurrence of the species belonging to the family Sterculiaceae in Bangladesh have been presented. Detailed herbarium study at Royal Botanic Gardens, Kew (K), Royal Botanic Garden, Edinburgh (E), British Museum (BM), Bangladesh National Herbarium (DACB) and Dhaka University Salar Khan Herbarium (DUSH) has revealed the occurrence of 32 species under 15 genera of the Sterculiaceae in Bangladesh. The correct name, important synonym(s), salient diagnostic characteristics, specimens examined and distributional notes have been provided for each species. Dichotomous bracketed keys have also been presented for identification of genera and species.

Introduction

The Sterculiaceae is a family of tropical and sub-tropical plants, comprising nearly 70 genera and 1,500 species (Cronquist, 1981). They are characterized by the presence of stellate hairs, bilocular anthers, 10 to numerous stamens in two or more whorls, mostly connate by their filaments, superior ovary, anatropous ovules and axile placentation. The family consists of soft-wooded trees and shrubs, and a few herbaceous and climbing species. Many species growing in rain forests are remarkable for their development of plank buttresses. Systematically it is placed in the Malvales by Engler and Prantle (1896), and shows many features in common with the other families of that group, namely Tiliaceae, Elaeocarpaceae, Bombacaceae and Malvaceae. Evidence from floral anatomy and embryology suggests that the Sterculiaceae is the most primitive in the Malvales (Brizicky, 1966). Hooker (1874) recognized six tribes of the Sterculiaceae, viz., Sterculieae, Helictereae, Eriolaeneae, Dombeyeeae, Hermannieae and Buettnerieae (Byttnerieae). Based on floral anatomy and embryology the tribe Sterculieae is regarded as the most primitive because of the presence of pentacyclic flowers, numerous stamens, apocarpous gynoecia, and many ovulate locules, while the Hermannieae is the most advanced tribe as it possesses tetracyclic flowers, a reduced number of stamens and ovules, and a tendency of perigyny. In respect to perianth structure, the Helictereae and Byttnerieae appear to be the most highly specialized tribes of Sterculiaceae (Brizicky, 1966).

Several taxonomic treatments on the Sterculiaceae have been made based on morphology (Robyns and Cautrecasas, 1964; Hsiang-Hao, 1984; Malick, 1993; Verdcourt, 1995; Phengklai, 2001). Hooker (1874) worked out the Sterculiaceous taxa of British India, while Prain (1903) dealt with the species of the then Bengal documenting 20 species and 9 species, respectively from the area of present Bangladesh. Despite Khan (1972-1989), and Khan and Rahman (1989-2002) published the Flora of Bangladesh in different fascicles covering several angiospermic families, the Sterculiaceae was not included in those treatments. Ahmed et al. (2009) listed 25 species of

1 Corresponding author. Email: dr_oliur@yahoo.com
2 Former Principal Scientific Officer, Bangladesh National Herbarium, Mirpur 1, Dhaka 1216, Bangladesh.
3 Former Consultant-Taxonomist, University of Illinois at Chicago, USA.
Sterculiaceae under 13 genera from Bangladesh. Very recently Mia et al. (2011) reported three species of Sterculiaceae, namely Guazuma ulmifolia Lam., Helicteres viscosa Bl. and Sterculia urens Roxb. as new distributional records for Bangladesh. However, no detailed study was carried out on this family so far. Moreover, plants of Bangladesh belonging to this family deposited in different foreign herbaria, particularly Royal Botanic Gardens, Kew (K), Royal Botanic Garden, Edinburgh (E) and British Museum (BM) have never been investigated earlier. The present study aimed at studying all species of Sterculiaceae of Bangladesh deposited in the herbaria both at home and abroad, and documenting and detailing all members of the family occurring in Bangladesh along with their updated nomenclatural and distributional notes.

Materials and Methods
The present study is based on both literature survey and herbarium studies. Plants deposited at K, E, BM, Bangladesh National Herbarium (DACB) and Dhaka University Salar Khan herbarium (DUSH) have been examined critically. Dichotomous artificial keys have been provided for identification of genera and species. Nomenclature has been updated for each species along with their important synonyms following Verdcourt (1995), Phengklai (2001) and Ahmed et al. (2009). Salient diagnostic characters, specimens examined and distributional notes have also been furnished under each species.

Results
The present study revealed the occurrence of 32 species under 15 genera of the family Sterculiaceae in Bangladesh. A dichotomous artificial key to genera of the Sterculiaceae is given below.

Key to the genera:

1. Leaves simple. 2
   - Leaves compound. Sterculia
2. Petals present; flowers bisexual or polygamous; herbs, shrubs or trees. 3
   - Petals absent; flowers unisexual or polygamous; trees or shrubs 12
3. Ovary stipitate. 4
   - Ovary sessile. 6
4. Anther loculi parallel, linear; seeds winged. Pterospermum
   - Anther loculi divaricate; seeds not winged. 5
5. Mature carpels inflated; flowers in a large terminal panicle. Kleinhovia
   - Mature carpels not inflated, but often spirally twisted; flowers solitary or fasciculated. Helicteres
6. Capsules 5-winged; staminodes emarginate. Abroma
   - Capsules not winged; staminodes acute. 7
7. Fertile stamens 5; capsules covered with stiff, long spines or prickles. Byttneria
   - Fertile stamens 10-15; capsules tuberculate or downy tomentose. 8
8. Petals with hooded claw. Capsules tuberculate, muricate with soft plumose bristles. **Guazuma**
- Petals without hooded claw.

9. Petals mostly persistent and often enlarged after flowering. **Pentapetes**
- Petals deciduous or very inconspicuous after flowering.

10. Annual herbs; flowers usually solitary. **Dombeya**
- Trees and shrubs; flowers rarely solitary.

11. Ovary 5-locular; styles 5. **Melochia**
- Ovary 1-locular; style 1. **Waltheria**

12. Fruiting carpels strongly keeled, indehiscent, 1-seeded. **Heritiera**
- Fruiting carpels slightly keeled, 1-many seeded.

13. Anthers regularly arranged in one or more whorls. Seeds several, attached along the entire margin of open carpels, distinctly winged. **Pterygota**
- Anthers irregularly crowded in a cluster at the apex of androgynophore.

14. Leaves palmately lobed; fruits membranous; seeds borne on margin of carpels. **Firmiana**
- Leaves not palmately lobed; fruits leafy; seeds not borne on margin of carpels. **Scaphium**

---

Type: *Theobroma augusta* L. [*Abroma augusta* (L.) L. f.]


A shrub or small tree. Leaves cordate, repand-denticulate, with acuminate to cuspidate apex and cordate base, base 3-7 nerved. Flowers dark red. Fruit a capsule, conical, winged. **Flowering and fruiting**: June-December.


**Distribution**: Australia, Bhutan, China, India, Indonesia, Malaysia, Nepal, Pacific islands, Philippines, Thailand and Vietnam.
Type: Byttnneria scabra Loeft. ex L.

Key to the species:
1. Leaves entire, glabrescent above and puberulous on nerves beneath; inflorescence minutely puberulous; flower buds ovoid. B. aspera
- Leaves finely serrate-dentate, stellate-pubescent on both surfaces; inflorescence densely stellate-pubescent; flower buds conical. B. pilosa


A woody climber or scandent shrub. Leaves cordate with cuspidate apex and cordate base, 5-7 nerved at the base. Flowers greenish, minute, 4-5 mm across. Fruit a capsule, globose, sparsely stellate hairy, armed. Flowering and fruiting: May-December.

Sylhet: Wallich no. 1144, 2 (BM).

Distribution: Bhutan, Cambodia, China, India, Laos, Nepal, Thailand and Vietnam.


A large scandent shrub or woody climber with grooved hispid branchlets. Leaves suborbicular, palmately lobed with acute or cuspidate apex and cordate base, stellate pilose on both surfaces. Flowers pale yellow, 4-6 mm across. Fruit a globose capsule, with black, hairy spiny tubercules. Flowering and fruiting: September-February.


Distribution: China, India, Indonesia, Laos, Malaysia, Myanmar, Thailand and Vietnam.
DOMBEYA Cav., Diss. 121: t. 38, 41 (1787).

Key to species:
1. Peduncle more than 20 cm long; sepals linear-oblong; stigma exserted.  
   D. wallichii
- Peduncle up to 8 cm long; sepals lanceolate; stigma included.  
   D. mastersii


A stellate tomentose shrub. Leaves broadly ovate, entire or occasionally obscurely 3-lobed, deeply cordate at the base, acute to acuminate at the apex. Flowers white or pinkish-white. Stigma included. Fruit a capsule, oblong, villous. Planted in the gardens. *Flowering and fruiting*: December-April.


*Distribution*: Tropical Africa, India and Pakistan.


A large evergreen shrub or small tree. Leaves large, cordate with acute to acuminate apex and cordate base. Flowers bright pink or red, fragrant. Stigma exserted. Fruit a capsule, ovate-oblong, densely villous. Planted in the gardens. *Flowering and fruiting*: April-July.

*Specimens examined*: Dhaka: s. loc., 10.2.1947, Sukdeo, s.n. (DUSH); Dr. Kanago’s garden, 10.2.1947, Sukdeo, s.n. (DUSH); C & B Nursery, 18.2.1966, S.K. Dutta 111 (DUSH); Dhaka, January 1942, A.K. Acharja, s.n. (DUSH).

*Distribution*: Indigenous to Madagascar, introduced elsewhere.


Type: *Sterculia platanifolia* L. f. [Firmiana simplex (L.) Wight]


A medium-sized spreading, deciduous tree with fluted stem. Leaves crowded at the end of branchlets, palmately 3-5 lobed, lobes triangular, with acute to cuspidate apex and cordate to truncate base. Flowers scarlet or orange-red, polygamous. Fruit a follicle, oblong. *Flowering and fruiting*: March-June.

*Specimens examined*: Chittagong: Jaldi, Napura, 3.4.1921, J.M. Cowan 1281 (E); Sitakund, 10.1.1851, J.D. Hooker & T. Thomson (K). *Chittagong Hill Tracts*: Raimatang hill, 6.4.1947,

Type: Guazuma ulmifolia Lam.


A small to moderate sized tree. Young twigs covered with rusty-brown or light grey stellate hairs. Leaves oblong-lanceolate with acuminate apex and obliquely cordate base. Flowers yellow. Fruit a capsule, oblong, covered with black tubercles. Flowering and fruiting: January-September.


Distribution: A native of tropical America and Java, cultivated in India, Myanmar and Pakistan.


Type Helicteres isora L.

Key to the species:
1. Ripe carpels spirally twisted. H. isora
   - Ripe carpels straight, not twisted. 2
2. Leaves with obtuse or slightly oblique base; petals pale violet; stamens 10; ovary hairy. H. elongata
   - Leaves with auriculate or cordate base; petals white or yellow; stamens 15; ovary glabrous. H. viscida


A diffuse straggling shrub with slender branchlets and stellate hairs on all parts. Leaves oblong-lanceolate to obliquely ovate, with acute to acuminate apex and obtuse or slightly oblique base. Flowers pale violet. Fruit a follicle, cylindrical, hairy, beaked. Flowering and fruiting: June-December.

Distribution: China, India, Myanmar, Thailand and Vietnam.
Note: Malick (1993) reported the occurrence of this species from Bangladesh without citing any specific locality. Although Ahmed et al. (2009) cited this species from Bangladesh, however no specimen belonging to this species was available for citation.


A large shrub or small tree, stellately hairy throughout. Leaves ovate, broadly elliptic or elliptic-ovate with cuspidate apex and cordate or rounded base. Flowers orange-red with black dots on inner part of the corolla. Fruit a follicle, cylindrical, spirally twisted with an apical beak. **Flowering and fruiting:** April-December.

**Specimens examined:** **Dhaka:** Savar, 10.9.1868, C.B. Clarke 7665 (K); Balda garden, 21.6.1966, S.K. Dutta 148 (DUSH); Savar, 7.8.1969, L. Nessa 110 (DUSH); Savar, near cantonment, 18.8.1977, Khan & Huq K 4513 (DACB); Near Nayerhat, June 1982, Yusuf s. n. (DACB); Dhaka University Botanic garden, 8.10.2011, M.Z. Uddin, s.n. (DUSH). **Chittagong:** Banskhali, Jaldi beat, 14.5.1990, Khan et al. K 8351 (DACB). **Tangail:** Gorai, 31.3.1973, Khan & Huq K 8351 (DACB). **Distribution:** Australia, Cambodia, China, India, Indonesia, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam.


A shrub with stellate hairs on all parts. Leaves ovate-oblong to lanceolate with cuspidate apex and auriculate or cordate base. Flowers white or yellow. Fruit a capsule, oblong or cylindrical, beaked, covered with shaggy hairs. **Flowering and fruiting:** July-March.

**Specimen examined:** **Chittagong:** Jaldi Range, Boilchari, 2.12.1920. J.M. Cowan 1618 (E). **Distribution:** China, Indonesia, Laos, Malaysia, Myanmar, Thailand and Vietnam.


**Key to species:**

1. Samara with a longitudinal ridge; leaves with faint secondary nerves and veins. **H. fomes**
   - Samara winged or wing-like; leaves with prominent secondary nerves and veins. **H. littoralis**
2. Fruit body up to 2 × 1 cm; epicarp dull; pistil and stamens on a slender column with parallel sides. **H. fomes**
   - Fruit body not less than 5 × 3 cm; epicarp shining; pistil and stamens on a based column, narrowed in the distal half. **H. littoralis**
3. Anthers irregularly clumped on androgynophores; leaves with 8-11 pairs of lateral nerves.  

   - Anthers in regular rings on androgynophores; leaves with 4-5 pairs of lateral nerves.


A moderate-sized evergreen tree. Leaves spirally arranged, elliptic-lanceolate or ovate, with acute to mucronate apex and tapering to rounded base. Male flowers with 5-10 stamens. Female flowers with 4-6 carpels; epicarp dull. Fruits ellipsoid or globular, woody. **Flowering and fruiting**: September-December.


Chittagong: Matamori Reserve, Chokaria, 1.4.1920, J.M. Cowan 780 (E); Charandrin, 15.4.1927, J.M Cowan s.n. (E); Garjania, s. dies, J.M. Cowan 456 (E). **Chittagong Hill Tracts:** Matangi reserve, 7.4.1920, J.M. Cowan 780 (E). **Cox’s Bazar:** Bagkhali river, Kurish Kool, 4.12.1944, J. Sinclair 3836 (E); Chakaria Sundarban, near Dulaazara, 12.6.1979, Khan, Huq & Rahman, K 5595 (DACB). **Khulna:** Dec. 1888, C.B. Clarke 24893 (K); Sundarbans, Oct. 1881, J.S. Gamble 10097 (E); Sundarbans, July 1890, R. Quinnell s. n. (E); Jassore, 14.6.1874, C.B. Clarke 21769 (BM); Sundarbans, 31.1.1895, Heinig s. n. (BM); Sundarban tidal forest, 20.6.1966, M. Ismail & M. Bhowmik 180 (DUSH); Sundarban, Bhadra, 23.3.1970, M.S. Khan 1919 (DUSH); Sundarban, Kotka, 22.1.1995, M.A. Hassan 1224 (DUSH); Sundarban, Jongra, 5.11.2001, N. Uddin & F. Deodatus N 1151 (DACB);. **Satkhira:** Munshiganj, Burigualimini, 11.12.1989, Huq et al. H 9368 (DACB).

**Distribution:** India, Myanmar and Thailand.


A small to medium-sized evergreen tree. Leaves ovate to oblong, with acute apex and obtuse to subtruncate base. Male flowers with 8-10 stamens. Female flowers with 4-5 carpels. Fruit a samara, ellipsoid, with one apical fish-tail wing. **Flowering and fruiting**: May-December.

**Specimen examined:** s. loc. & dies, P. Maheshwary, 13.9.49, s.n. (DUSH).

**Distribution:** Australia, Cambodia, China, India, Indonesia, Malaysia, Myanmar, the Philippines, Sri Lanka, Thailand, Vietnam and East Africa.


A medium-sized tree. Leaves oblong, with acute apex and obtuse to slightly cordate base. Male flowers with 6-8 stamens; anthers irregularly clumped on androgynophore. Female flowers with 1 carpel. Fruit a samara, ellipsoid, with one apical fish-tail wing. **Flowering and fruiting**: November-February.

Distribution: Cambodia, China, India, Laos, Myanmar, Thailand and Vietnam.


A small to moderate-sized tree. Leaves variable in shape, lanceolate, oblanceolate or oblong to elliptic with obtuse base. Male flowers with slender staminal column; anthers in regular rings on androgynophore. Female flowers with 5-6 ovary. Fruit a single-seeded samara. *Flowering and fruiting*: April-December.

Specimen examined: Sylhet: Wallich Cat. no. 7836 (K).

Distribution: India.


A small tree, with straight trunk. Leaves cordate to ovate, with acute, cuspidate or rounded apex and cordate to truncate base. Flowers pink. Stamens 10, staminodes 5. Ovary 5-locular. Fruit a capsule, inflated, membranous. *Flowering and fruiting*: February-April.

Specimens examined: Dhaka: s. loc., 26.11.1945, Sukdeo, s.n. (DUSH); Sadarghat, 26.12.1943, Atul, s.n. (DUSH); Sadarghat, 26.12.1943, S.K. Sen, s.n. (DUSH).

Distribution: Australia, China, India, Indonesia, Malay Peninsula, Philippines, Polynesia, Sri Lanka, Thailand and tropical Africa.

**MELOCHIA** L., Sp. Pl. : 674 (1753); Gen. Pl. 1: 223 (1862).

Lectotype: *Melochia corchorifolia* L.


Annual herb, young parts sparsely hairy. Leaves ovate, ovate-lanceolate, oblong-ovate or suborbicular with truncate or obtuse base and acute apex. Flowers pinkish. Fruit a globose or subglobose capsule. *Flowering and fruiting*: March-June.


Distribution: Australia, China, India, Indonesia, Malay Peninsula, Myanmar, Philippines, Polynesia, Thailand and Vietnam.

Type. Pentapetes phoenicea L.


Annual herb to undershrub with few scattered stellate hairs on the bark. Leaves linear lanceolate, with acuminate or cuspidate apex and cuneate or obtuse base. Flowers pink to red. Fruit a globose or subglobose capsule, 5-valved. **Flowering and fruiting:** September-January.


Distribution: Australia, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand and Vietnam.


Key to the species:

1. Capsules angular; leaves peltate; petals glabrous on both surfaces; style glabrous. **P. acerifolium**
   - Capsules not angular; leaves not peltate; petals hairy on outer surface; styles hairy on lower half. 2
2. Leaves with a slightly oblique base, sparsely hairy or glabrescent on lower surface; fruiting calyx caducous. **P. lanceaefolium**
   - Leaves with strongly sagittate base, woolly on lower surface; fruiting calyx persistent. **P. semisagittatum**


A medium-sized to large evergreen tree. Leaves polymorphous, peltate, with cordate base. Flowers white or yellowish, fragrant. Fruit a capsule, oblong, woody, rusty brown, glabrescent. **Flowering and fruiting:** February-June.

Specimens examined: Chittagong: Cheval Reserve forest, 27.2.1968, Majumdar & Islam 39A, 39B (K); Sitakund, 13.1.1851, J.D. Hooker & T. Thomson 621 (K). Dhaka: s. loc., March 1938, N.K. Chatterji, s.n. (DUSH); Ramna, 10.2.1954, Shahjahan, s.n. (DUSH); Balda garden, 17.2.1988, Rezia, Huq & Mia R 231 (DACB). Habiganj: Chunarughat, Kalenga beat, 1.4.1997,

**Sylhet:** Wallich no. 11702 (K). **Munshiganj:** Vikrampur, 30.10.1868, C.B. Clarke 7937 (BM).

**Distribution:** Bhutan, China, India, Laos, Malaysia, Myanmar, Nepal, Pakistan and Thailand.


A small to medium-sized tree, young parts tomentose. Leaves lanceolate-oblong, oblanceolate or obovate-oblong, with acute, acuminate or cuspidate apex and slightly oblique base. Flowers yellowish or white, fragrant. Fruit an elliptic to ovoid capsule, densely hairy. **Flowering and fruiting:** October-April.

**Specimens examined:** **Sylhet:** Wailich no. 1172 (K, BM); Sylhet station, 24.9.1872, C.B. Clarke 17955 (BM); Jafflong (37 miles away), 30.4.1981, Huq, Rahman & Mia H 5121 (DACB); Jafflong, 20.10.1986, Huq & Mia H 7904 (DACB).

**Distribution:** China, India, Malaysia, Myanmar, Thailand and Vietnam.

**Pterospermum semisagittatum** Buch.-Ham. ex Roxb., Fl. Ind. ed. Carey 3: 160 (1832); Mast. in Hook. f., Fl. Brit. Ind. 1: 368 (1874); Kurz, Fl. Burm. 1: 146 (1877); Prain, Beng. Pl. 1: 276 (1903); Craib, Fl. Siam. Enum. 1: 177 (1925); Malick in Sharma & Sanjappa (eds), Fl. India 3: 453 (1993).

A small to moderate-sized tree. Leaves oblong to oblong-lanceolate, with acute to cuspidate apex and sagittate base. Flowers white, fragrant. Fruit a capsule, cylindrical or elliptical, rusty-tomentose. **Flowering and fruiting:** April-August.

**Specimens examined:** **Chittagong:** Jaldi Range, Taballa Chera, 6.5.1921, J.M. Cowan 399 (E); Razu Reserved Range, 17.5.1920, J.M. Cowan s. n. (E); Gobania, 31.5.1920, J.M. Cowan 335 (E); Rezu Range, 16.8.1920, J.M. Cowan 215 (E); Mirsari, 19.5.1920, Cowan 126 (E); s. loc., Nov. 1862, Pierre 9718 (E, BM); Sitakund 5.1.1851, J.D. Hooker & T. Thomson 374 (K); s. loc., October 1940, S.K. Sen, s.n.; Cheval Reserve forest, 10.6.1967, S. Majumdar & A. Islam 73A (K); 24.7.1966, S. Mazumdar & A. Islam 73B (K); Harbang to Aziznagar, 13.6.1979, Khan, Huq & Rahman K 5609 (DACB); Chunati Game Reserve, 22.4.1994, Huq & Mia H 10318 (DACB). **Chittagong Hill Tracts:** Phasoha, 28.2.1879, J.S. Gamble 6725A (K); Sept. 1886, Dr. King’s Coll. 232 (K, BM). **Cox’s Bazar:** Kelatali, 21.3.1945, J. Sinclair 4054 (E); Harikhola, Whykong range, 2.6.2000, Khan et al. K 10523 (DACB). **Sylhet:** Tamabil, 29.4.1981, Huq, Rahman & Mia H 3960 (DACB).

**Distribution:** Cambodia, India, Laos, Myanmar, Sri Lanka and Thailand.


**Type:** Sterculia alata Roxb. [Pterygota alata (Roxb.) R. Br.].

A large deciduous tree with narrow conical crown. Leaves broadly ovate with acute to broadly acute apex and cordate or truncate base, usually clustered at the end of brachlets. Flowers brownish-yellow. Fruit a woody follicle, globose to ellipsoid, pubescent. **Flowering and fruiting:** December-May.

**Specimens examined:** **Chittagong:** Chuniti Game Reserve, 24.4.1994, Huq & Mia H. 10332 (DACB). **Chittagong Hill Tracts:** *s. loc.*, Mar. 1880, J.S. Gamble 7898 (K). **Dhaka:** *s. loc.*, 24.2.1947, Sukdeo, *s.n.* (DUSH); Azimpur Army Recruiting office compound, 1.11.1963, A.F. Muhammad 34 (DUSH); Ranna, 3.2.1947, S.K. Sen, *s.n.* (DUSH); Dhaka University TSC area, 10.9.1982, A.M. Huq 5688 (DACB). **Sylhet:** Wallich no. 1122, 1 (K).

**Distribution:** Bhutan, China, India, Malaysia, Myanmar, Pakistan, Philippines, Thailand and Vietnam.

**SCAPHIUM** Schott. & Endl., Melet. Bot.: 33 (1832).

**Type:** *Scaphium wallichii* Schott. & Endl.


A medium-sized to large deciduous tree. Leaves ovate to ovate-oblong, with acute to acuminate apex and obtuse to truncate base. Petals absent. Male flowers with 10-15 stamens; female flowers with 5 carpels. Fruit a follicle, boat-shaped, membraneous. **Flowering and fruiting:** February-May.

**Specimens examined:** **Rangamati:** 50 miles south of Rangamati, Apr. 1934, Macalpine & W.J.L. Wenger 476 (K); May 1933, W.J.L. Wenger *s.n.* (K).

**Distribution:** Cambodia, Malay Peninsula, Myanmar and Thailand.


**Type:** *Sterculia foetida* L.

**Key to species:**

1. Leaves digitate or palmately lobed.  
   - Leaves not lobed.  
2. Leaves digitate.  
   - Leaves palmately lobed.  
3. Leaflets whitish pubescent beneath; calyx lobes inflexed; staminal column c. 2 mm long.  
   - Leaflets glabrous beneath when mature; calyx lobes spreading; staminal column c. 10 mm long.  
4. Leaves deeply 5-7 lobed; lobes 3-fid, villous beneath; flowers large, c. 2 cm wide; follicles spreading.  
   - Leaves shallowly 5-lobed, entire; softly thick velvety beneath; flowers small, less than 8 mm wide; follicles radiating.  
5. Calyx lobes broadly ovate, spreading.  
   - Calyx lobes linear or linear-lanceolate, connivent at the top.
6. Leaves glabrous above, rusty-tomentose beneath, cordate or subcordate at base. **S. guttata**
   - Leaves glabrous on both surfaces, more or less rounded at base. **S. roxburghii**

7. Fruits lanceolate; staminal column 4-5 mm long. **S. hamiltonii**
   - Fruits ovate; staminal column less than 4 mm. **S. parviflora**

8. Leaves glabrous or glabrescent on both surfaces; calyx urceolate; style glabrous.
   - Leaves densely stellate hairy on both surface; calyx campanulate; style hairy. **S. balanghas**


A small to medium-sized evergreen tree. Leaves elliptic-oblong to obovate-oblong, stellate hairy on both surfaces, with blunt, acute or acuminate to caudate apex and rounded base. Flowers yellow or greenish-purple, fragrant. Petals absent. Fruits a follicle, oblong, narrowed at both ends. **Flowering and fruiting:** January-May.

*Specimens examined:* **Bengal:** s. loc. & s.n., 1796 (BM); Wallich no. 1131 (BM); Wallich no. 1133 (BM); **Rangamati:** Kasalong Reserve, Mainimukh, 12.3.1940, T.V. Dent. s.n. (?)

**Distribution:** India, Indonesia, Malay Peninsula, Myanmar, Nepal, Sri Lanka and Thailand.


A medium to large deciduous tree. Leaves elliptic, elliptic-lanceolate or elliptic-oblong, crowded at the end of branchlets. Flowers dull red, purplish or yellow. Petals absent. Fruit a follicle, woody, boat-shaped. **Flowering and fruiting:** November-April.

*Specimens examined:* **Cox’s Bazar:** Kutubdia, Barkup, 27.12.1983, Huq, Rahman & Mia H 6653 (DACB). **Dhaka:** s. loc., 24.2.1947, Sukdeo, s.n. (DUSH); Azimpur maternity hospital, 12.8.1964, A.F. Muhammed 180 (DUSH).

**Distribution:** Cambodia, China, India, Indonesia, Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam, Eastern Africa and North Australia.


A moderate-sized deciduous tree. Leaves broadly ovate to ovate-oblong, with acute or abruptly shortly acuminate apex and rounded or slightly cordate base. Flowers white or pale

Specimen examined: Sylhet: Wallich no. 1127 (BM?).


Distribution: Bhutan, India, Myanmar and Nepal.


Specimen examined: Sylhet: S. loc. & s. dies Wallich 1121/1 (BM).

Distribution: India, Indonesia, Malay Peninsula, Myanmar, Thailand and Vietnam.


A medium-sized tree, with ashy bark. Leaves oblong-elliptic or oblongate, with acuminate apex and rounded or subcordate base. Racemes few-flowered, with sparingly stellate pilose pedicels. Flowers red. Fruit a follicle, ellipsoid-lanceolate. Flowering and fruiting: February-August.

Specimen examined: Chittagong: Dhopasari, 21.3.1921, J.M. Cowan2046 (E); 2.4.1920, J.M. Cowan 156 (E). Sylhet: s. dies Wallich nos. 1124, 1125 (K).

Distribution: China and India.

STERCULIACEAE IN BANGLADESH

A deciduous tree. Leaves crowded at the end of branchlets, palmately 3-5 lobed, with acuminate to cuspidate apex and deeply cordate base. Flowers yellow. Fruit a follicle, oblong, ellipsoid or kidney-shaped, densely rusty pubescent. Flowering and fruiting: October-February.

Specimen examined: Chittagong: s. loc. 31.12.1850, J.D. Hooker & T. Thomson 302 (K).

Distribution: India and Sri Lanka.


A large tree with spreading crown. Leaves peltate, elliptic-lanceolate with acute or shortly acuminate apex and tapering base, pubescent beneath. Flowers orange-yellow or pale yellow, fragrant. Petals absent. Fruit a slightly compressed follicle. Flowering and fruiting: March-July.

Specimen examined: Cox's Bazar: Moheshkali, 7.3.1978, Khan et al. K 4895 (DACB).

Distribution: India and Myanmar.


Distribution: Bhutan, Cambodia, China, India, Myanmar, Nepal, Pakistan and Thailand.


Type: Waltheria indica L.


A much branched erect herb or undershrub. Leaves ovate, ovate-oblong or elliptic-ovate, with acute to rounded apex and shallowly cordate to obtuse base. Flowers yellow. Fruit a capsule, ovoid, with an acute hooked apex. Flowering and fruiting: April-December.


Distribution: Pantropical.
Acknowledgement

The authors thank the authorities of the herbaria K, E, BM and DACB for allowing them to study specimens and use the library facilities.

References


(Manuscript received on 8 January, 2012; revised on 5 May, 2012)